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(54) INK JET RECORDING MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an ink jet recording medium which has a high ink absorptive property, an equally high degree of luster and an equal image sharpness to a silver salt photograph.

SOLUTION: In this ink jet recording medium consisting of an ink recording layer formed on a support, the ink recording layer is composed of a resin composition containing a thermoplastic hydrophilic resin, and is formed by a melt extrusion coating method. The melting point of the thermoplastic hydrophilic resin should preferably be 210°C or less and its melt flow ratio (temperature: 190°C, load: 2160g) be 1-50g/10min.

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CLAIMS

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[Claim(s)]

[Claim 1] The ink-jet record object characterized by for the ink record layer having consisted of a resin constituent containing the hydrophilic resin which has thermoplasticity in the ink-jet record object which has an ink record layer in a base material, and forming an ink record layer by the melting knockout coating method.

[Claim 2] The ink-jet record object according to claim 1 210 degrees C or less and whose melt flow ratio (temperature of 190 degrees C, 2160g of loads) the melting point of the hydrophilic resin which has thermoplasticity is 1-50g / 10 minutes.

[Claim 3] The ink-jet record object according to claim 1 or 2 characterized by the hydrophilic resin which has thermoplasticity being a copolymer resin which contains an ethylene unit and a vinyl alcohol unit at least.

[Claim 4] The ink-jet record object according to claim 1 or 2 with which the hydrophilic resin which has thermoplasticity is characterized by being a copolymer resin containing a vinyl acetate unit, a vinyl alcohol unit, and the ethylene unit that has a hydrophilic group in a side chain at least.

[Claim 5] The ink-jet record object according to claim 1 or 2 characterized by the hydrophilic resin which has thermoplasticity being a polymer resin which contains an oxy-alkylene machine at least.

[Claim 6] The ink-jet record object according to claim 1 or 2 characterized by the hydrophilic resin which has thermoplasticity being a polymer resin which contains an ethylene oxide unit at least.

[Claim 7] The claims 1, 2, 3, 4, and 5 whose base materials are sheet-like base materials which covered the polyolefin resin content resin constituent to the paper base, or an ink-jet record object according to claim 6.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] About an ink-jet record object, especially this invention is excellent in ink absorptivity, and relates to the ink-jet record object which has high glossiness equivalent to a silver salt photograph, and image sharpness.

[0002]

[Description of the Prior Art] Since unlike a thermal imprint recording method an ink sheet is unnecessary and maintenance does not need the process of development like an electrophotography method, and fixing easily, the ink-jet recording method has the feature that color record of high resolution is possible, at high speed with miniaturization of equipment. Therefore, it has spread quickly in recent years as the output printer and facsimile of a personal computer, or an output method of a copying machine. Moreover, the opportunity for the printed output of not only a document but a color picture to be performed increases by highly-efficientizing of a personal computer, and the spread of multimedia, it excels in ink absorptivity, and the needs to the ink-jet record object with which high glossiness equivalent to a silver salt photograph and the record picture which has image sharp nature are increasing.

[0003] Although the so-called regular paper type which processed it into pulp paper of ink-jet record object is generally conventionally used as an ink-jet record object, when a color picture is recorded The ink-jet record object of the coated-paper type which carried out coating of absorptivity inorganic pigments, such as a silica, and the paint which carried out combination manufacture of the binders, such as polyvinyl alcohol, a polyvinyl pyrrolidone, or gelatin, to pulp paper from ink receptiveness, such as color fixing of a dot configuration, the sharpness of a dot, the absorption capacity of ink, ink rate of absorption, and ink, is liked. However, since the contraction nonuniformity based on the paper-making formation of pulp paper occurred on pulp paper at the process which carries out coating dryness of the ink record layer and some BOKOTSUKI appeared in a front face, gloss was insufficient for the ink-jet record object usual coated-paper type, or when combination of an absorptivity pigment was made [ many ], ZARATSUKI resulting from the pigment particle arose and it had the problem of gloss falling.

[0004] The ink-jet record form with which surface glossiness has the strong gloss to which it is characterized by forming the coat containing the cross linking agent of polyvinyl alcohol and 5 - 50 % of the weight of opposite polyvinyl alcohol whose degree of saponification 80% or more of cast coated paper or a brightness by Hunter is 50-90-mol % at base materials, such as 80% or more of sheet plastic, is indicated by JP,3-25352,B. However, even if it uses cast coated paper as pulp paper, in order to once absorb moisture at the process of coating dryness of a paint, generating of BOKOTSUKI in a dryness process could not be suppressed, but gloss was inadequate. Or although there is no BOKOTSUKI resulting from the formation of a base material and high gloss was acquired when using the sheet plastic, compared with pulp paper, neither a feeling of a feel, nor feeling and stiffness could be insufficient for the sheet plastic, and generally it is not only expensive, but it was not able to satisfy a demand of a commercial scene.

[0005] In JP,5-212952,A, it is the ink jet record object which prepared the binder content ink acceptance layer in the base material, and an ink acceptance layer contains a hydrophilic binding material and oxidization polyethylene, and the ink jet record object with which oxidization polyethylene is characterized by existing as oxidization polyethylene emulsified by cation activity in the aquosity covering material used for an ink acceptance layer is indicated. Moreover, the base material is indicating the ink-jet record object which is the base paper or plastic film by which polyolefine covering was carried out. However, in order to attain ink absorption required for color record although the ink-jet record object of a high gloss is acquired when such a base paper by which polyolefine covering was carried out is used, it is comparatively thick in an ink record layer, and it is amount of coating 15 g/m<sup>2</sup> about. It is necessary to carry out beyond a grade. Usually, although coating of the ink record layer is carried out as a drainage system paint, in order to obtain sufficient amount of coating, it needs to raise paint concentration or needs to make [ many ] the amount of wet coating. However, if the concentration of these paints usually raises concentration too much within the limit of about

10 - 20 % of the weight, the viscosity of a paint will become high rapidly and the handling by the coating machine will become difficulty. Or when it was going to raise the amount of wet coating, even if it could carry out coating, the dryness load of a coater became excessive, the thermal contraction of a base material arose, it is not only ruined, but gloss fell or un-arranging [ of productivity falling ] occurred.

[0006]

[Problem(s) to be Solved by the Invention] When the above-mentioned problem is solved and is printed with an ink jet printer, this invention is excellent in ink absorptivity, and offers the ink-jet record object which has high glossiness equivalent to a silver salt photograph, and image sharpness.

[0007]

[Means for Solving the Problem] this invention contains the following mode.

[1] The ink-jet record object characterized by for the ink record layer having consisted of a resin constituent containing the hydrophilic resin which has thermoplasticity in the ink-jet record object which has an ink record layer in a base material, and forming an ink record layer by the melting knockout coating method.

[0008] [2] thermoplasticity -- having -- a hydrophilic property -- a resin -- the melting point -- 210 -- degree C -- less than -- melt -- a flow -- a ratio (temperature of 190 degrees C, 2160g of loads) -- one - 50 -- g -- /-- ten -- a minute -- it is -- [-- one --] -- a publication -- an ink jet -- record -- the body .

[0009] [3] [1] characterized by the hydrophilic resin which has thermoplasticity being copolymer resin which contains an ethylene unit and a vinyl alcohol unit at least, or an ink-jet record object given in [2].

[0010] [4] [1] to which the hydrophilic resin which has thermoplasticity is characterized by being the copolymer resin containing a vinyl acetate unit, a vinyl alcohol unit, and the ethylene unit that has a hydrophilic group in a side chain at least, or an ink-jet record object given in [2].

[0011] [5] [1] characterized by the hydrophilic resin which has thermoplasticity being a polymer resin which contains an oxy-alkylene machine at least, or an ink-jet record object given in [2].

[0012] [6] [1] characterized by the hydrophilic resin which has thermoplasticity being a polymer resin which contains an ethylene oxide unit at least, or an ink-jet record object given in [2].

[0013] [7] The ink-jet record object of [1], [2], [3], [4], [5], or [6] publications whose base material is a sheet-like base material which covered the polyolefin resin content resin constituent to the paper base.

[0014]

[Embodiments of the Invention] The melting object of the resin constituent which has thermoplasticity on the surface of a base material is extruded, the ink-jet record object of this invention is applied by the coating method, and pressing to the peripheral surface of the cooling roll turning around the applied melting resin constituent layer, cooling solidification is carried out and it is acquired.

[0015] Aquosity coating cannot be used for hydrophilic resins, such as polyvinyl alcohol prepared as a water paint which is independent or was blended with the absorptivity inorganic pigment from before at the ink record layer of an ink-jet record object, by the melting extrusion method of what is made. Because, although thermoplasticity had the melting point at about 230 degrees C, it was easy to pyrolyze the conventional hydrophilic resin, and it does not have what shows a moderate fluidity with an extruder, and was not able to carry out melting knockout coating. However, in this invention, when at least about 200 degrees C carry out melting fabrication with an extruder like polyethylene etc. using the hydrophilic resin which has the thermoplasticity by which a pyrolysis is not generated, the ink record layer was prepared and high glossiness and image sharpness have been obtained.

[0016] Although melting processing of the resin constituent which makes a subject the hydrophilic resin which has the aforementioned thermoplasticity is carried out at 150-300 degrees C, the still more desirable range is 180-220 degrees C. It is more nearly lacking in the fluidity within a low and a melting extruder, or the spread nature of a sheet-like melting object than 180 degrees C, and adhesion with a base material also becomes weak, and this temperature is not suitable for processing. Moreover, if higher than 220 degrees C, we will be anxious about disassembly of a resin with a case. Although it will not limit especially if the melting point (JIS K 7121) of the hydrophilic resin which has the thermoplasticity used for this invention can carry out melting knockout coating, 210 degrees C or less are desirable. In the temperature of 190 degrees C, and 2160g of loads, 1-50g/10min and the desirable range of the melt flow rate (MFR, JISK 7210) of a hydrophilic resin which has the thermoplasticity of this invention are 2-20g/10min(s). When MFR is small, the torque of a



melting extruder may become excessive or un-arranging [ of a resin heat-deteriorating ] may arise. moreover, when large, the amount of knockout resins may become unstable and un-arranging -- trouble appears in stable operation -- may arise Especially the density of the hydrophilic resin which has thermoplasticity is density 0.7 - 1.5 g/cm<sup>3</sup>, although not limited. It is a grade.

[0017] If the hydrophilic resin which has the thermoplasticity of this invention is a hydrophilic resin which fitness is in melting knockout coating, and can absorb the ink for ink-jet record, it chooses its one kind or two kinds or more suitably and is usable. For example, the copolymer resin containing an ethylene unit and a vinyl alcohol unit can be used. The ethylene-vinyl alcohol copolymer (EVOH) or ethylene-vinyl acetate-vinyl alcohol acetal copolymer resin etc. is desirable. Especially the mole fraction of each unit of these copolymer resin does not limit. Although plasticity is demonstrated at melting knockout temperature and the ink absorptivity as an ink record layer should just be demonstrated, as for the mole fraction of an ethylene unit, it is desirable that it is [ 25-90 mol ] %. Or the copolymer resin containing a vinyl acetate unit, a vinyl alcohol unit, and the ethylene that has a hydrophilic group in a side chain can also be used at least. The copolymer shown by the following formula, i.e.,  $-(CH_2-CHOH)_l-[CH_2-CH(CH_3-OCO)]_m-(CH_2-CHR)_n-$ , and R1 For example, a hydrogen atom or an alkyl group, Or hydrophilic groups (for example, alkyl group replaced by hydrophilic groups or these hydrophilic groups, such as a carboxyl group, the aceto acetyl group, an amino group, and a sulfone machine), and l, m and n It is shown by one or more integer].

[0018] Moreover, it is also possible to use the polymer resin which contains an oxy-alkylene machine at least. For example, for the oxy-alkylene machine content vinyl alcohol system polymer shown by the following formula, i.e.,  $-(CHR_2-CHR_3-O)_p-H$ , R2, and R3, a hydrogen atom or an alkyl group (especially a methyl group or an ethyl group), and p are integer]. The saponification object of the copolymer of the ethylene nature unsaturation monomer and vinyl acetate containing the oxy-alkylene machine shown is useful.

[0019] As an example of the ethylene nature unsaturation monomer containing an oxy-alkylene machine, polyoxyethylene (meta) acrylate, polyoxypropylene (meta) acrylate, a polyoxyethylene (meta) acrylamide, a polyoxypropylene (meta) acrylamide, polyoxyethylene (1-(meta) acrylamide -1, 1-dimethyl pulley pill) ester, the polyoxyethylene (meta) allyl-compound ether, the polyoxypropylene (meta) allyl-compound ether, polyoxyethylene vinyl ether, polyoxypropylene vinyl ether, etc. are mentioned. p which shows the number of addition mols of an oxy-alkylene unit In any case, it is two to about 300, and is especially p. Five to about 200 are desirable. In the above, thermoplasticity and ink absorptivity have the polyoxyethylene allyl-compound ether, the polyoxypropylene allyl-compound ether, the polyoxyethylene meta-allyl-compound ether, the good polyoxypropylene meta-allyl-compound ether, etc., and practicality is large. Or the polymer resin which contains ethylene oxide at least can also be used.

[0020] These can be used [ Kuraray / Co., Ltd. / for example, / Nippon Synthetic Chemical Industry / Co., Ltd. / a trademark "Unitika resin UMR" (saponification object of an ethylene-vinyl acetate copolymer), or ] from a trademark "Eval" (ethylene vinyl alcohol copolymer resin) and Unitika Chemicals from what is marketed as a trademark "SOANORU" (ethylene vinyl alcohol copolymer resin), being able to choose. Moreover, Kuraray Make and trademark: "Kuraray poval CP series" (denaturation polyvinyl alcohol) or the Nippon Synthetic Chemical Industry Co., Ltd. make, a trademark : "EKOMATI" (denaturation polyvinyl alcohol) It has the suitable hydrophilic ability for suitable thermoplasticity to carry out melting knockout coating and ink absorption, and can be used preferably. Moreover, Sumitomo Seika Chemicals Co., Ltd. make and trademark: "AKUA coke" (ethylene oxide polymer) or Dai-Ichi Kogyo Seiyaku Co., Ltd. make, and trademark: "PAOGEN" (ethylene oxide polymer) can be used.

[0021] The resin constituent which consists of a hydrophilic resin which has the thermoplasticity of this invention can blend suitably general-purpose resin and naturally-occurring-polymers material, a pigment, etc. if needed. As for the loadings of a general-purpose resin or naturally-occurring-polymers material, it is desirable that it is 0.1 - 10 weight section to the hydrophilic resin 100 weight section which has thermoplasticity. It is effective in being able to improve the melting fluidity of a resin constituent and improving melting extruding aptitude by combination. Moreover, as for a pigment, it is desirable that it is the 1 - 100 weight section to the hydrophilic resin 100 weight section which has thermoplasticity.

[0022] Moreover, as an additive, one sort, such as a color, a fluorescent dye, a color pigment, an antioxidant, an ultraviolet ray absorbent, an antistatic agent, a cross linking agent, a deck-watertight-luminaire-ized agent,

and a cation nature resin, or two sorts or more can be chosen, and small quantity can be added. As a general-purpose resin which can be blended, polyethylene, polypropylene, the poly methyl pentene, A polybutene, a crystalline polybutadiene, a polybutadiene, polystyrene, Styrene butadiene resins, a polyvinyl chloride, polyvinyl acetate, a polymethylmethacrylate, A polyvinylidene chloride resin, polytetrafluoroethylene, an ethylene poly tetrapod ethylene copolymer, An ethylene-vinyl acetate copolymer, an AS resin, ABS plastics, an ionomer, An AAS resin, a ACS resin, polyacetal resin, polyamide resin, polycarbonate resin, A polyphenylene oxide, a polyethylene terephthalate, a polybutylene terephthalate, A polyarylate, a polysulfone, polyether sulphone, a polyimide, a polyamidoimide, polyphenylene sulfo imide, cellulose acetate, a cellulose acetate butyrate, celluloid, cellophane, nylon, etc. are illustrated.

[0023] As a naturally-occurring-polymers material, a starch system macromolecule, a cellulose system macromolecule, other other saccharides system macromolecules, a protein system macromolecule, etc. are illustrated. A corn starch, potato starch, sweet potato starch, rice starch, beans starch, physical denaturation starch, enzyme denaturation starch, chemistry denaturation starch, chemical-decomposition denaturation starch, esterification starch, bridge formation starch, etc. are illustrated. As a cellulose system macromolecule, a methyl cellulose, an ethyl cellulose, a hydroxyethyl cellulose, hydroxypropylcellulose, a hydroxyethyl methyl cellulose, a hydroxypropyl methyl cellulose, a hydroxy butyl methyl cellulose, a carboxymethyl cellulose, an acetyl cellulose, etc. are illustrated. As other other saccharides system macromolecules, glycogen, a xylan, a chitin, chitosan, an alginic acid, a sodium alginate, guar rubber, gum, \*\*\*\*\*, an agar, etc. are illustrated. As a protein system macromolecule, collagens, such as gelatin and glue, casein, a zein, gluten, a blood albumin, soybean protein, a pullulan, etc. are illustrated.

[0024] As a pigment, a non-fixed form silica, a gaseous-phase method composition silica, a synthetic particle silica, A synthetic particle alumina silicate, a kaolin, clay, baking clay, magnesium sulfate, An aluminum oxide, an aluminum hydroxide, a calcium carbonate, a satin white, Colloidal silica, anionic colloidal silica, cation nature colloidal silica, An alumina sol, a pseudo-boehmite alumina sol, aluminum silicate, a smectite, It chooses suitably, and it is independent, or a zeolite, diatomaceous earth, a montmorillonite group mineral, a hydrotalcite group mineral, a smectite group mineral, a bentonite group mineral, a plastics pigment, a grain starch-granule child, etc. can be mixed and used. Especially the ink record layer that consists of the aforementioned resin constituent formed on a base material is 10 - 100 g/m<sup>2</sup>, although not limited. Melting knockout coating is carried out in the amount of coating. although the film production stability of a melting resin constituent and an adhesive property with a base material may be inferior if there are few amounts of coating, and ink absorptivity will improve if a coating layer is conversely thick, even if it makes [ many ] it, about [ that the effect beyond it is not expectable ] and record material becomes thick, or more than required, cost becomes high and the problem which is becoming less practical etc. arises balance with ink absorptivity to 20 - 60 g/m<sup>2</sup> it is -- things are desirable

[0025] Moreover, support processing by medicine application can be performed on the aforementioned support surface, or surface activity-ized processing of corona discharge processing, flame processing, low-temperature plasma treatment, etc. can also be performed in order to strengthen adhesion with the aforementioned resin constituent and a sheet-like base material. Moreover, after playing and applying ozone content gas to the field of the side which touches the sheet-like base material of the aforementioned resin melting object breathed out from the melting extruder, it can also perform applying on a base material if needed. Although sheet-like base materials, such as paper of fine quality, a coated paper, a synthetic paper, a high polymer film, or resin covering paper, can be used for a base material, since an adhesive property with an ink record layer is raised further, priming can also be performed.

[0026] Higher glossiness and image visibility are obtained in the mode using the resin covering paper which covered the front face of a paper base with the polyolefin resin (or front-face and rear face) content resin constituent as a base material. Moreover, the adhesive property of the resin constituent and the aforementioned base material containing the hydrophilic resin which has thermoplasticity is also good. The polyolefin resin used in order to cover one side or both sides of a sheet-like base can be chosen from two or more sorts of mixture of homopolymers, such as ethylene and alpha olefins, for example, a propylene etc., two or more sorts of copolymers of the aforementioned olefin, and these various polymers etc. Especially desirable polyolefin resin is a low density polyethylene, a high density polyethylene, straight chain-like low

density polyethylenes, and such mixture. Although there is especially no limit in the molecular weight of these polyolefin resin, the thing of the range of 20,000-200,000 is usually used. The amount of coating of each enveloping layer of the front reverse side is 10 - 40 g/m<sup>2</sup>. It is formed on a sheet-like base.

[0027] Various additives, such as white pigments, blue pigment, a fluorescent brightener, an antioxidant, a fluorescent dye, and lubricant, can also be added in order to raise performances, such as a whiteness degree required for the resin constituent used for the above-mentioned enveloping layer, a color tone, and concealment nature. Moreover, the polyolefin resin enveloping layer by the side of a rear face is not hindered by giving mat processing, either. Furthermore, a back-coat layer can also be prepared in the front face of a rear-face side enveloping layer in order to give antistatic, printing note nature, etc. A melting extruder can perform covering of polyolefin resin.

[0028] The melting extruder (extrusion coating equipment) generally called laminator can be used for the melting knockout equipment of this invention used at the process which covers a resin constituent on a paper base, and the process which covers an ink record layer to a base material. Sticking-by-pressure cooling is operated between the pressure rolls by which the laminator flowed down the thermoplastics constituent (for example, ink acceptance layer) in the shape of a film through the extruder and the T die, carried out coating to the base material, and rubber lining was carried out with the metal cooling roll on which this was stuck. Or the cooling roll which gave detachability can also be used. It is supplied from an extruder hopper, and, and melting homogenization is carried out, and a thermoplastics constituent reaches a T die through a screen and a breaker plate, and flows down the inside of a cylinder broadly. From a die center section, a melting resin spreads right and left and forms the thin film of a melting resin. It is sent from the delivery section, falls on the sheet-like base by which surface treatment was carried out if needed the middle, it is cooled simultaneously with adhesion with a cooling roll and a pre shear roll, and the film of this melting resin is rolled round by the winder. Coating layer thickness takes over with the discharge quantity of a resin, and is adjusted with the lip of speed and a T die. The ink-jet record sheet of this invention can also carry out coating of a polyolefin resin enveloping layer and the ink record layer to a paper base simultaneously using the coextrusion laminating method.

[0029] Still more nearly another ink record layers (a pigment, an adhesives content layer, resin layer, etc.) can also be prepared on the ink record layer of this invention specification.

[0030]

[Example] The following example explains this invention further.

Example 1 basis-weight 175 g/m<sup>2</sup> and bulk density 1.0 g/cm<sup>3</sup> A corona treatment is given to both sides of a paper base, and it is in the record layer side. the polyolefin resin constituent 1 for front faces of the following composition containing 10 % of the weight of titanium dioxides which carried out mixed distribution by the Banbury mixer beforehand -- the amount of coating -- 30 g/m<sup>2</sup> Coating was carried out using the melting extruder which has T type die as becomes (melting temperature of 320 degrees C), and the cooling roll which gave the mirror finish is used, the front face high-smooth-boils the cooled aforementioned surface coating layer, and it was made to become at this time. Moreover, it is the polyolefin resin constituent 1 for rear faces of the following composition in the opposite field Amount of coating 25 g/m<sup>2</sup> It is made to become. As coating was carried out with the melting extruder (melting temperature of 320 degrees C) which has T type die, sandblasting processing was first performed for the front face by \*\*\*\* of 120 meshes and the front face became mat-like about the aforementioned rear-face enveloping layer cooled using the cooling roll which has the shape of surface type which next gave and finished chrome plating processing, the sheet-like base material was obtained.

[0031] Polyolefin resin constituent 1 low-density-polyethylene resin for front faces (trademark : show REKKUSU L-182, the Showa Denko K.K. make, density 0.919, the melt flow ratio 8 g/10 min) . 60 weight sections, high-density-polyethylene resin (trademark : show REKKUSU L-191, Showa Denko K.K. make, and density 0.935 g/cm<sup>3</sup>, the melt flow ratio 11 g/10 min) 30 weight sections, anatase type titanium dioxide (the Ishihara Sangyo make, trademark:A-220) 10 weight sections, zinc stearate The 0.1 weight sections, the antioxidant (product made from Ciba-Geigy, IRUGA NOx 1010) 0.05 weight section, the ultramarine blue (made in [ the first Chemicals ], trademark:blue-shade ultramarine blue No.2000)

[0032] Polyolefin resin constituent 1 high-density-polyethylene resin for rear faces (trademark : show



REKKUSU L-191, Showa Denko K.K. make, and density 0.935 g/cm<sup>3</sup>, the melt flow ratio 11 g/10 min) 65 weight sections, the low-density-polyethylene resin (trademark : show REKKUSU L-170, Showa Denko K.K. make, and density 0.917 g/cm<sup>3</sup>, melt flow ratio 7 g/10 min) 35 weight section.

[0033] Next, it is a thermoplasticity hydrophilic-property resin after performing corona discharge processing to the front face of the side-front polyethylene-resin enveloping layer of the above-mentioned base material. It is a polyvinyl alcohol derivative (Kuraray Make, trademark:CP-1000, melt flow ratio (MFR) 2g/10min, density 1.25 g/cm<sup>3</sup>, 174 degrees C of melting points) containing an oxy-alkylene machine The melting temperature of 190 degrees C, working-speed 20 m/min, and amount of coating 50 g/m<sup>2</sup> While carrying out melting knockout coating, it cooled using the cooling roll which gave the mirror finish, and the polyvinyl alcohol layer with the specular gloss was formed.

[0034] As [ after giving corona discharge to the front face of the polyethylene-resin covering paper produced like example 2 example 1 ] a thermoplastic hydrophilic-property resin. the denaturation polyvinyl alcohol ( Nippon Synthetic Chemical Industry make --) which consists of structure of having a vinyl acetate unit, a vinyl alcohol unit, and the ethylene unit that has a hydrophilic group in a side chain Trademark : EKOMATI AX2000, melt-flow-rate (MFR) 20g/10min, They are the melting temperature of 220 degrees C, working-speed 20 m/min, and amount of coating 40 g/m<sup>2</sup> in density 1.27 g/cm<sup>3</sup> and 199 degrees C of melting points. While carrying out melting knockout coating, it cooled using the cooling roll which gave the mirror finish, and the ink record layer with the specular gloss was formed.

[0035] Example 3 basis-weight 175 g/m<sup>2</sup> and bulk density 1.0 g/cm<sup>3</sup> As [ after giving corona discharge to the front face of a paper base ] a thermoplastic hydrophilic-property resin. It is denaturation polyvinyl alcohol ( Kuraray make, trademark:CP-2000, melt-flow-rate (MFR) 2g/10min, density 1.24 g/cm<sup>3</sup>, 130 degrees C of melting points) The melting temperature of 180 degrees C, working-speed 20 m/min, the amount of coating of 20g/m<sup>2</sup> While carrying out melting knockout coating, it cooled using the cooling roll which gave the mirror finish, and the ink record layer with the specular gloss was formed.

[0036] The number of addition mols of the manufacture oxyethylene of an example 4 resin constituent copolymerized the polyoxyethylene allyl-compound ether and vinyl acetate of about 25 under existence of an azobisisobutyronitril as a catalyst in the methanol, and the vinyl acetate unit obtained [ the polyoxyethylene (meta) allyl-compound ether unit ] 80% of the weight of the copolymer 20% of the weight. Subsequently, it saponified by the conventional method and % of the degree [ of a vinyl acetate component ] oxyethylene machine content vinyl alcohol system polymer of saponification of 93 mols was obtained. The melt flow rates of this copolymer were 15g / 10min, and densities were 1.15 g/cm<sup>3</sup> and 200 degrees C of melting points. Subsequently, after drying the fine particles of this oxyethylene machine content vinyl alcohol system polymer to 0.1 or less % of the weight of water parts and carrying out preliminary mixture of the ink record layer constituent of the following prescription by the Banbury mixer, while carrying out mixed distribution with the biaxial extruder and extruding to the line, it pelletized.

[0037] record -- the layer prescription above-mentioned oxyethylene machine content vinyl alcohol system polymer 100 weight section, the low-density-polyethylene (Mitsui Petrochemical Industries, Ltd. make, trademark:MIRASON M-14P, density 0.919, melt flow ratio 5.1g/10min, 107 degrees C of melting points) 2 weight section, the detailed silica (1.5 micrometers of mean particle diameters) 2 weight section, the corn-starch 2 weight section, and the glycerol 5 weight section [0038] Subsequently, it is the ink record layer constituent above-mentioned after giving corona discharge to the front face of the polyethylene-resin covering paper produced like the example 1 The melting temperature of 220 degrees C, a working speed, 20 m/min, and amount of coating 40 g/m<sup>2</sup> While carrying out melting knockout coating, it cooled using the cooling roll which gave the mirror finish, and the ink record layer with the specular gloss was formed.

[0039] Example 5 basis-weight 107 g/m<sup>2</sup> and bulk density 0.75 g/m<sup>3</sup> As [ after giving corona discharge to the front face of a paper base ] thermoplastics. It is a polymer resin (3 the product made from the first Industry, trademark:PAOGEN PP-15, melt flow ratio (MFR) 30g/10min, 55 degrees C of density melting points of 1.07g/cm<sup>3</sup>) containing a polyethylene oxide The melting temperature of 150 degrees C, working-temperature 10 m/min, and amount of coating 20 g/m<sup>2</sup> Melting extrusion was carried out, while carrying out coating, it cooled using the cooling roll which gave the mirror finish, and the ink record layer with the specular gloss was formed.

[0040] Example 6 basis-weight 104 g/m<sup>2</sup> and bulk density 0.85 g/m<sup>3</sup> As [ after giving corona discharge to the front face of a paper base ] thermoplastics. It is an ethylene vinyl alcohol resin (3 Kuraray Make, trademark:Eval EP-H105, melt flow ratio (MFR) 5.5g/10min, 165 degrees C of density melting points of 1.14g/cm) The melting temperature of 230 degrees C, working-temperature 10 m/min, and amount of coating 20 g/m<sup>2</sup> Melting extrusion was carried out, while carrying out coating, it cooled using the cooling roll which gave the mirror finish, and the ink record layer with the specular gloss was formed.

[0041] Glossy paper for ink-jet record of marketing which prepared the ink record layer which carried out data smoothing of the front face to the example of comparison 1 absorptivity inorganic pigment including the binder component (the product made from Canon, Inc. , trademark:GP-101).

[0042] After giving corona discharge to the front face of the polyethylene-resin covering paper produced like example of comparison 2 example 1, the ink record layer of the following composition is prepared in drainage system paints, and it is the amount of coating 12 g/m<sup>2</sup> Coating was carried out by the bar coat method so that it might become.

ink -- the record layer prescription full saponification Pori Vinnie Al Kohl ( Kuraray make, trademark:Kuraray poval 117) 93 weight section, cross-linking-agent ( ) Showa Denko make, and the trademark:PAPIRORU J-0037 weight section [0043] The hydrophilic resin which has the thermoplasticity used for it in the example 1 after giving corona discharge to the front face of the polyolefin resin covering paper produced like example of comparison 3 example 1 is dissolved in water, and it is the amount of coating 15 g/m<sup>2</sup> Coating was carried out by the bar coat method so that it might become. That is, denaturation polyvinyl alcohol (Nippon Synthetic Chemical Industry Make, trademark:EKOMATI AX2000, melt-flow-rate (MFR) 20g/10min, density 1.27 g/cm<sup>3</sup>, 199 degrees C of melting points) was dissolved so that it might become 20 % of the weight of concentration, and the paint was prepared.

[0044] Example of comparison 4 basis-weight 175 g/m<sup>2</sup>, and bulk density 1.0g/cm<sup>2</sup> As [ after giving corona discharge to the front face of a paper base ] thermoplastics. It is a low-density-polyethylene resin (3 the Mitsui Petrochemical Industries, Ltd. make, trademark:MIRASON M-11P, melt-flow-rate (MFR) 7.2g/10min, 106 degrees C of density melting points of 0.917g/cm) The melting temperature of 260 degrees C, working-speed 20 m/min, the amount of coating of 30g/m<sup>2</sup> While carrying out melting extrusion coating, it cooled using the cooling roll which gave the mirror finish, and the front face with the specular gloss was obtained.

[0045] The method shown below estimated the gloss, the image visibility, and ink absorptivity of a solid portion after carrying out printing record with the glossiness of the ink-jet record object of evaluation each example and each example of comparison, image visibility, and a commercial ink jet printer (made in Hewlett Packard, trademark:Deskjet 560J).

(1) About the solid portion and white portion which were made to color in glossiness yellow, a Magenta, and the color ink of cyanogen, according to the method (specular gloss of 60 incident angles and 60 light-receiving angles) of JIS-Z -8741, it measured by the gloss meter (the product made from a Japanese \*\*\* industry (stock), trademark:VG-10), and 5 times of measured value was averaged.

[0046] (2) The value when using width of face of 2mm of an optical comb among the image sharpness specified by JIS-K -7105 about the solid portion and white portion which were made to color in image sharpness yellow, a Magenta, and the color ink of cyanogen was measured, and 5 times of measured value was averaged.

[0047] (3) Evaluation of ink absorptivity ink absorptivity pressed paper of fine quality against the printed solid portion, and was performed by measuring time until the ink imprinted to paper of fine quality is no longer accepted. It evaluated to the three-stage (less than [ 0:7 second ], \*\*:7 - 15 seconds, and more than x:15 second). An evaluation result is shown in Table 1.

[0048]

[Table 1]

	光沢度 ベタ部／白紙部	像鮮鋭度 ベタ部／白紙部	インク吸収性
実施例 1	7 5 / 8 5	7 0 / 7 5	○
実施例 2	7 0 / 8 3	6 8 / 7 2	○
実施例 3	6 9 / 8 2	6 3 / 6 7	○
実施例 4	7 5 / 8 0	7 0 / 7 5	○
実施例 5	7 0 / 7 5	6 0 / 6 5	○
実施例 6	6 8 / 7 5	6 2 / 6 0	○
比較例 1	6 0 / 6 5	3 0 / 5 0	○
比較例 2	7 0 / 7 5	6 0 / 6 5	×
比較例 3	5 5 / 6 0	3 0 / 5 0	△
比較例 4	- / 8 0	- / 7 5	×

[0049] Although the sheet for ink-jet record of the examples 1-6 concerning this invention had good ink absorptivity and glossiness and image visibility were excellent, the glossiness before and behind ink record and the image sharpness of the sheet for ink-jet record of the example 1 of comparison of this invention out of range were low things. Ink absorptivity was insufficient for the sheet for ink-jet record of the example 2 of comparison. In the example 3 of comparison which considered as the water paint, applied and dried the coating layer of the completely same composition as this invention, and obtained it, the glossiness and image visibility of the blank paper section are low, and it is the amount of coating at drainage system coating 15 g/m<sup>2</sup>. Since it was not able to do mostly, it was that in which ink absorptivity is also inferior. Since the example 4 of comparison formed the record layer using general-purpose thermoplastics without a hydrophilic property, its ink absorptivity was very bad and it was not able to carry out printing record of it at all.

[0050]

[Effect of the Invention] By forming the resin constituent containing the hydrophilic resin which has thermoplasticity as an ink record layer by the melting knockout coating method, it excels in ink absorptivity, the record picture which has high glossiness and high image clarity is acquired, and the sheet for ink-jet record of this invention is practically very useful.

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[Translation done.]